11.0 DATA REDUCTION, REVIEW, VALIDATION, AND REPORTING

The analytical data generated by the laboratory shall be reviewed to assure the usability of the reported results. This internal data review process will consist of data generation, reduction, a minimum of three levels of documented review, and reporting.

11.1 DATA REDUCTION

Laboratory analytical data are first generated in raw form at the instrument. These data may be in either graphic or tabular form. Specific data reduction, generation procedures, and calculations are found in each of the methods referenced in Table 6-1, as well as within the laboratory LQAPP. Analytical results must be reported consistently. Data reduction will be performed by individuals experienced with a particular analysis, and knowledgeable of project QA/QC requirements.

11.2 DATA REVIEW

The technician/analyst who generates the analytical data is responsible for its correctness and completeness. The data review process involves evaluating both the results of the QC data and the professional judgement of the person(s) conducting the review. Applying technical knowledge and experience to the evaluation of data is essential in verifying that high quality data are generated.

The laboratory has documented procedures, which are to be followed and must be accessible to all laboratory personnel. The data review is generally conducted in a three-step process at the laboratory prior to submittal:

Level 1 - Technical Data Review - The analysts review the quality of their work based on an established set of guidelines. The review will verify, at a minimum, that appropriate preparation, analysis, and standards operating procedures have been followed; analytical results are correct and complete; QC samples are within established control limits; and that documentation is complete (e.g., any anomalies have been documented).

Level 2 - Technical Review - This level of review will be performed by a supervisor or data review specialist whose function is to provide an independent review of the data package. This review shall also be conducted according to an established set of guidelines (i.e., method requirements and laboratory standard operating procedures). The Level 2 review includes a review of qualitative and quantitative data, and a review of documented anomalies.

Level 3 - Administrative Data Review - The final review of the data, prior to submittal, is performed by the QA/QC officer or program administrator at the laboratory. This level provides a total overview of the data package to verify its consistency and compliance with project requirements.

11.3 DATA VALIDATION

Data validation is a systematic procedure of reviewing a body of data against a set of established criteria to provide a specified level of assurance of validity prior to its intended use. The validation will be performed following the general guidelines in USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review, EPA540/R-99/008, October 1999, USEPA CLP National Functional Guidelines for Inorganic Data Review, EPA540/R-01/008, July 2002. All samples will be reviewed independently (i.e., separately from the laboratory) for evaluation of data completeness, verification of chain-of-custody forms for correctness, review of holding time criteria, instrument calibration, assessment of QC blanks for contamination, assessment of laboratory precision and accuracy based upon duplicates and spike results and assessment of matrix interference. The independent review of data will be performed by environmental chemists, under the supervision of the URS Analytical Chemistry Task Manager, to verify compliance with specified analytical methods and project-specific precision, accuracy, representativeness, comparability, and completeness (PARCC) parameters.

11.4 DATA REPORTING

The laboratory hardcopy analytical reports will be equivalent to the Contract Laboratory Program (CLP) Organic and Inorganic Statement of Works, OLM04.2 and ILM04.0, respectively (or most current versions). A "Cooler Receipt Form" will also be required with each cooler and included in the deliverable data package for the purposes of noting problems in sample packaging, chain-of-custody, and sample preservation.

The laboratory will submit GISKey Electronic Data Deliverables.

11.5 LABORATORY TURNAROUND TIME

The contract laboratory will be required to submit the analytical hardcopy and electronic data packages, in accordance with Section 11.4, 21 working days from validated time of sample receipt at the laboratory.